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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/456,531	12/08/99	OHSAKA S	991387

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EXAMINER	
MENEFEE, J	
ART UNIT	**PAPER NUMBER**
2881	

DATE MAILED: 10/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/456,531	OHSAKA ET AL.	
	Examiner	Art Unit	
	James Menefee	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *17 and 18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☒ Claim(s) *13 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,7* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

In response to Preliminary Amendment A filed 18 February 2000 claims 7-12 have been amended. Claims 1-18 are pending.

Election/Restrictions

Applicant's election without traverse of group I, claims 1-16, in Paper No. 9 is acknowledged.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

Figure 14 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Claim Objections

Claims 13-14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 1 and 2

disclose an electrode structure. Claims 13-14 depend on claims 1-2 respectively, but do not limit the electrode structure. The applicant should remove the dependency on claims 1 and 2 of claims 13-14 by writing in the limitations from claims 1-2.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 15 and 16 depend on claims 13 and 14 respectively, however further down these claims have limitations which depend on claims 1 and 2 respectively. It is not exactly clear what the applicant is trying to claim, however these references to claims 1 and 2 are unnecessary given that the structure of the electrode is discussed in claims 13 and 14 (especially given the suggested modifications from the claim objections above). Instead of saying "an electrode structure according to claim 1 [2]" in line 5 of each claim, the applicant should write "said electrode structure".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's cited Kazue (JP 11-68253) in view of applicant's cited Takemura (JP 4-98841), and further in view of Misawa (US 6,150,725).

Regarding claims 1-6 and 13-14, Kazue discloses an electrode structure where a conductive film is formed on a substrate through an insulating film. The insulating film is a polyimide layer. The electrode structure is disclosed to be part of a semiconductor light-emitting device, specifically one comprising a waveguide disposed between upper and lower electrodes. It is not disclosed that the film be a plurality of poles with a harder insulating film on the insides of the poles, and a second polyimide film buried among the poles. It is not disclosed that the harder film is also on the upper surfaces of the poles.

Takemura teaches a semiconductor device that includes two dielectrics (i.e. insulators) that are disposed as poles in a layer under a conducting film. It would have been obvious to one skilled in the art to include the insulators in pole form to help prevent the spreading components in the lateral direction and therefore lessen the capacitance between the buried layers and the semiconductor layers, as taught by Takemura.

Now that it has been shown that the use of poles is obvious, it has not been disclosed to include the hard layer as mentioned above. Misawa teaches a semiconductor device where parts are protected by a hard layer 120 and an insulating polyimide layer 121. The layer 120 is strong and insulating for blocking moisture and contaminants and the layer 121 is for flattening (col. 5 line 35 – col. 6 line 24; col. 9 lines

54-57). It would be advantageous to protect any part of the semiconductor device that is below the surface, and it would be advantageous to flatten out the layer for proper layering of the conductive layer, therefore it would have been obvious to one skilled in the art to include the hard silicon nitride layer and the second polyimide layer, as taught by Misawa.

Regarding claims 7-8, it is not disclosed that the conductive film be formed on the insulation film through a third insulation film. It would have been an obvious duplication of parts to include another insulation layer between the conductive film and the first insulation layer. A second insulation layer disposed between the layers is already included, and it would have been obvious to one skilled in the art that including an extra layer will simply increase the effects of using only the second layer.

Regarding claims 9-10, it is not disclosed that the conductive film should be a bonding pad. Takemura shows a semiconductor device with a conductive film on top, the conductive film being a bonding pad. Since a bonding pad is simply a type of conducting film, it would have been an obvious art known substitution to use a bonding pad as the conducting film.

Regarding claims 11-12, it is not disclosed that the insulating layer is formed on top of a harder layer that is formed on the substrate. Misawa teaches that the parts that are surrounded by the hard layer 120 as shown above are also formed on top of a layer of silicon nitride 109 (col. 5 lines 14-24). It would have been obvious to one skilled in the art to form the insulating layer of the present invention on top of a harder layer in order

to surround the insulating layer with hard layers 120 and 109 to fully protect the insulating layer.

Regarding claims 15-16, as taught and understood, it is not disclosed that the semiconductor laser include a high resistance layer formed on the side of the waveguide with the upper electrode formed on top of this layer. Examiner takes Official Notice that it would have been well known in the art to include a high resistance layer on the side of the waveguide and under the upper electrode. These high resistance layers are often included in semiconductor lasers in order to confine the current in the laser to go through only a small active region, therefore it would have been obvious to one skilled in the art to include this layer to confine the current, as is well known.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mizushima (US 5,155,576) shows an electrode structure similar to the prior art shown in Applicant's Fig. 14. In Fig. 2 is shown a substrate 101, insulating layers 105, 107 surrounding insulating layer 106 which may be polyimide, and conducting layer 109.

Cox (US 6,166,439) shows a structure where conductive lines 54, 56, 58 are buried by a dielectric layer 60, with a low dielectric layer 59 filling the gaps between the lines. The low dielectric layer may be polyimide.

Tashiro (US 5,124,781) shows a structure where a polyimide layer 7 buries conductive lines (aluminum wires) 51 that are surrounded by insulating layers 52 under a conducting layer 54.

In both Cox and Tashiro, replacing the conductive lines by polyimide would yield applicant's invention, but there is no suggestion of doing so, as the conductive lines are necessary to the function of these devices and the polyimide will not perform the same function and thus be a suitable replacement.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Primary Examiner
AU 2881

JM
October 17, 2001